Engineering Shorts

Food For the Army and Navy

About 10,900,000 tons of foodstuffs were hauled last year by the American railroads for the Army and Navy, the Association of American Railroads reports. If the cars required to handle this load were placed end to end they would make a train reaching from coast to coast.

According to Army estimates, the railroads carried about 244,000 carloads of foodstuffs in 1944 for that branch of the service alone. This included 41,240 carloads of meats, 5,225 carloads of poultry, 3,900 carloads of butter, 4,280 carloads of fresh eggs, 12,440 carloads of sugar, and 2,800 carloads of dried beans and peas.

The Navy estimates that approximately 120,000 carloads of food were shipped by rail in this country to Naval stations in 1944, from producers or from supply depots to the smaller activities.

Breakdown of the Navy's figures reveals that about 54,000 carloads were dry provisions and 66,000 carloads were fresh, chilled, or frozen foods. Included in these totals were some 22,000 carloads of canned fruits, vegetables, and juices, 9,000 carloads of flour and cereals, 32,000 carloads of fresh vegetables, 10,000 carloads of fresh fruits, and about 20,000 carloads of chilled and frozen meats.

The present Philippine campaign affords a good example of the job the railroads must do to keep the armed forces supplied with food. For instance, the requirements for food for the Seventh Fleet alone amounted to 2,000 tons during the first 30 days of operations in Leyte. The great bulk of this was carried to the coast by the railroads.

Aside from the great quantities of food the railroads hauled for the services last year, they moved considerable food for our allies under the Lend-Lease program. In 1944 these shipments amounted to about 121,200 carloads. Some 37,800 cars contained meats and meat products. Some 23,000 others carried dairy products, and about 22,000 carried grains and cereals.

All fresh foods, as fruits, meats, and vegetables, were shipped via refrigerator cars. That which did not require refrigeration, such as grain, cereal, and dry foodstuffs, went in box cars. Highly perishable foods such as seafoods, fresh fruits and vegetables (for instance, strawberries) were shipped by express.

Quite an impressive array of figures, don't you think? We can be justly proud of our American railroads.

Bazookas

Added to the infantry rocket launcher, or "bazooka," are other types, including the paratroop model, the flying bazooka, and the portable field-artillery type. All of these were engineered, developed and produced by those who in peace years had devoted their attention to washing machines and other household appliances in the General Electric Company.

The grenade launcher for field artillery consists of a four foot tube and a tripod mounting. The projectile is three feet long, nearly as long as the barrel. Weighing only thirty-five pounds when loaded, the four-and-a-half inch weapon can be carried and fired by one man.

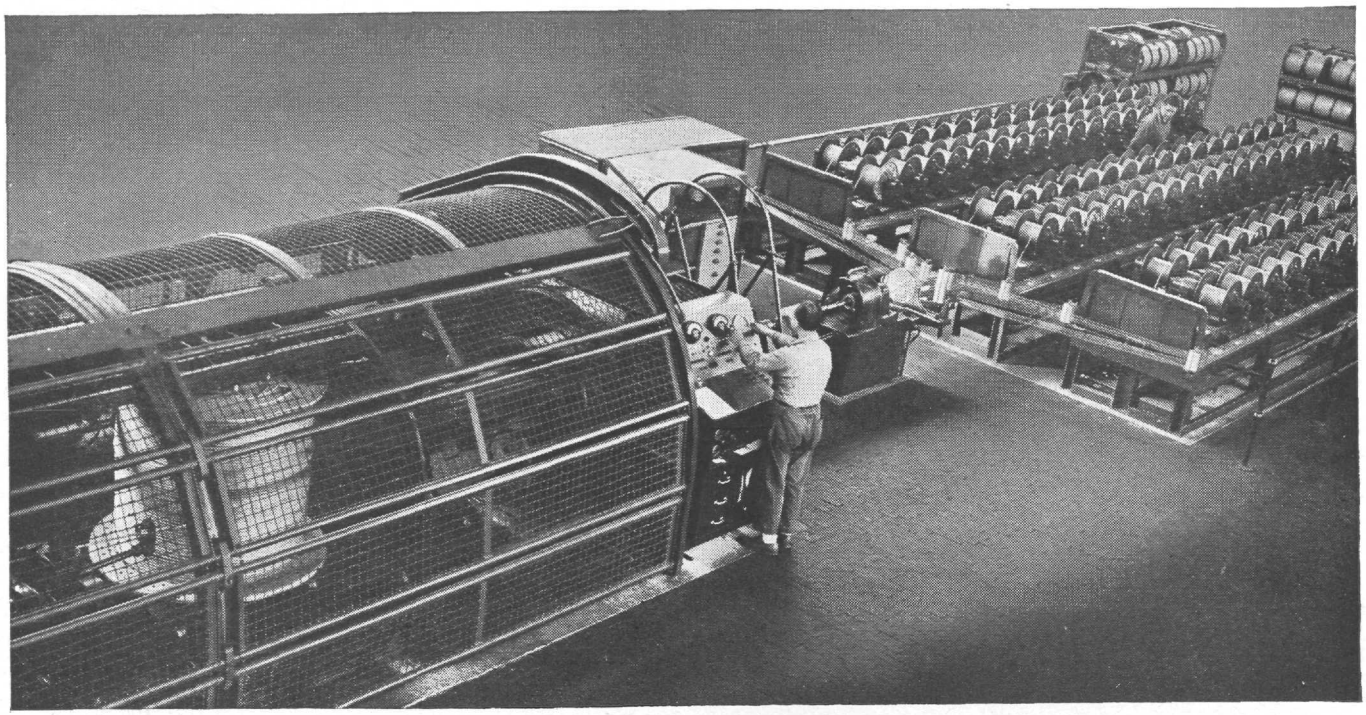
The paratroop model bazooka differs from its predecessors in that it can be folded, an important

Folding and non-folding types of bazookas.

fact when it is being carried through dense underbrush or over jungle trails. It first saw action in the invasion of France.

The flying bazooka consists of a cluster of three tubes, each ten feet long, of a special fire-resistant paper plastic. One cluster is attached to each wing of any of a number of types of planes. Firing is controlled by the pilot in the same manner as he fires his wing machine guns, simply by pressing the trigger in the control stick. All six barrels

(Please turn to page 20)



It's SOME machine!

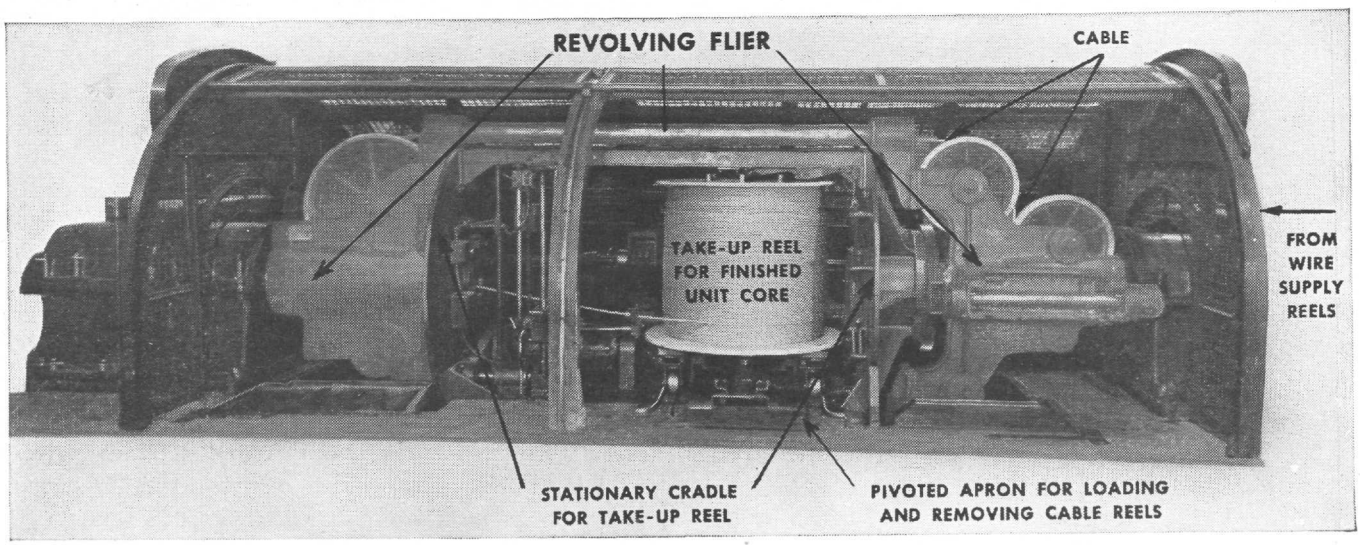
It's a high speed flier-strander which forms unit cores for telephone cable.

One-hundred-and-one pairs of paper pulp insulated copper wire from the supply reels are assembled and bound with cotton, then are taken into a unique revolving flier which twists them into a unit cable core—all at the rate of 600 linear feet per minute, or twice as fast as machines previously used. Several of these unit cores are later combined and sheathed in lead to make the familiar telephone cable.

Each of the 101 supply reels holds up to eight miles of paired wire and has an individual motor drive with sensitive control to insure uniform tension on the wire.

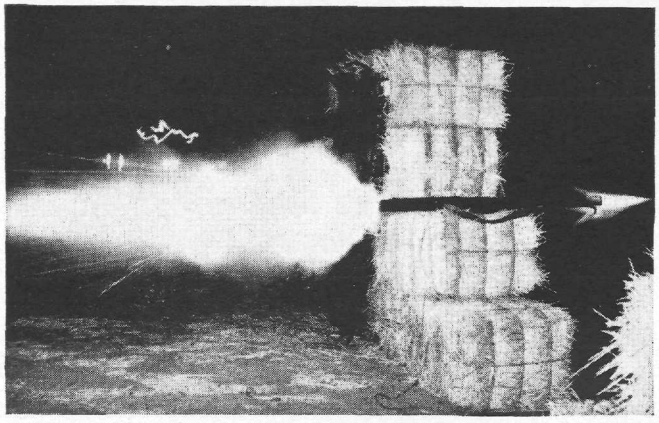
This is but one of many interesting and unusual machines designed by Western Electric engineers to advance the art of manufacture in the field of telephone equipment.

Buy all the War Bonds you can . . . and keep them!



HOW THE FLIER-STRANDER WORKS. The assembled and cotton-bound bundle of wires enters the machine at the right and passes into the revolving flier (shown in a lighter tone). In the flier, the wires pass over two pulleys, travel through a tube to the left end of the machine, pass around another pulley and enter the stationary cradle where the finished unit core is wound in smooth, even layers on the motor driven take-up reel. The flier revolves 200 times per minute and imparts two complete twists to the core each revolution, while an ingenious gear arrangement holds the cradle stationary within the revolving flier.

can be fired simultaneously or they can be fired individually by aiming. The rocket projectiles can also be used as bombs, the pilot dropping them on the target.



—All Illustrations Courtesy of General Electric

The Army demonstrates that there is no recoil in firing the bazooka by placing the weapon on bailed hay without stays. Back blast is to the left, projectile to the right.

Charge: $0.01

Here's what a penny's worth of electricity (at average household rates) will do. It will perform any of these jobs: brew 20 cups of coffee; vacuum-clean 10 large rugs; extract the juice from 240 oranges; make 40 slices of toast; run a sewing machine all afternoon; light a 50-watt lamp for 6 hours; cook a meal for one person; run the washer for 6 tubs of clothes; iron 20 table napkins; run a clock for a week; keep the refrigerator cold for 4 hours; operate the radio for 3 hours; run a fan for 6 hours.

It's very simple to explain why a woman has never been President of the United States. The President must be over 35.

Bossy Gets Hep

Old Bossy, the cow, dates back to Biblical times as a domestic animal—but the way she's handled these days down on the farm is strictly modern. For instance: cattle breeders select only pure-bred stock to produce Bossy in the first place—giving special attention to getting parent stock having high butterfat production ratings; she's fed hay dried by electric-powered driers; she's milked mechanically—and now the milk she produces is cooled by electric coolers.

Good Map Paper

The importance of knowing where you are is certainly apparent when applied to the war. The Army and Navy fully appreciate it.

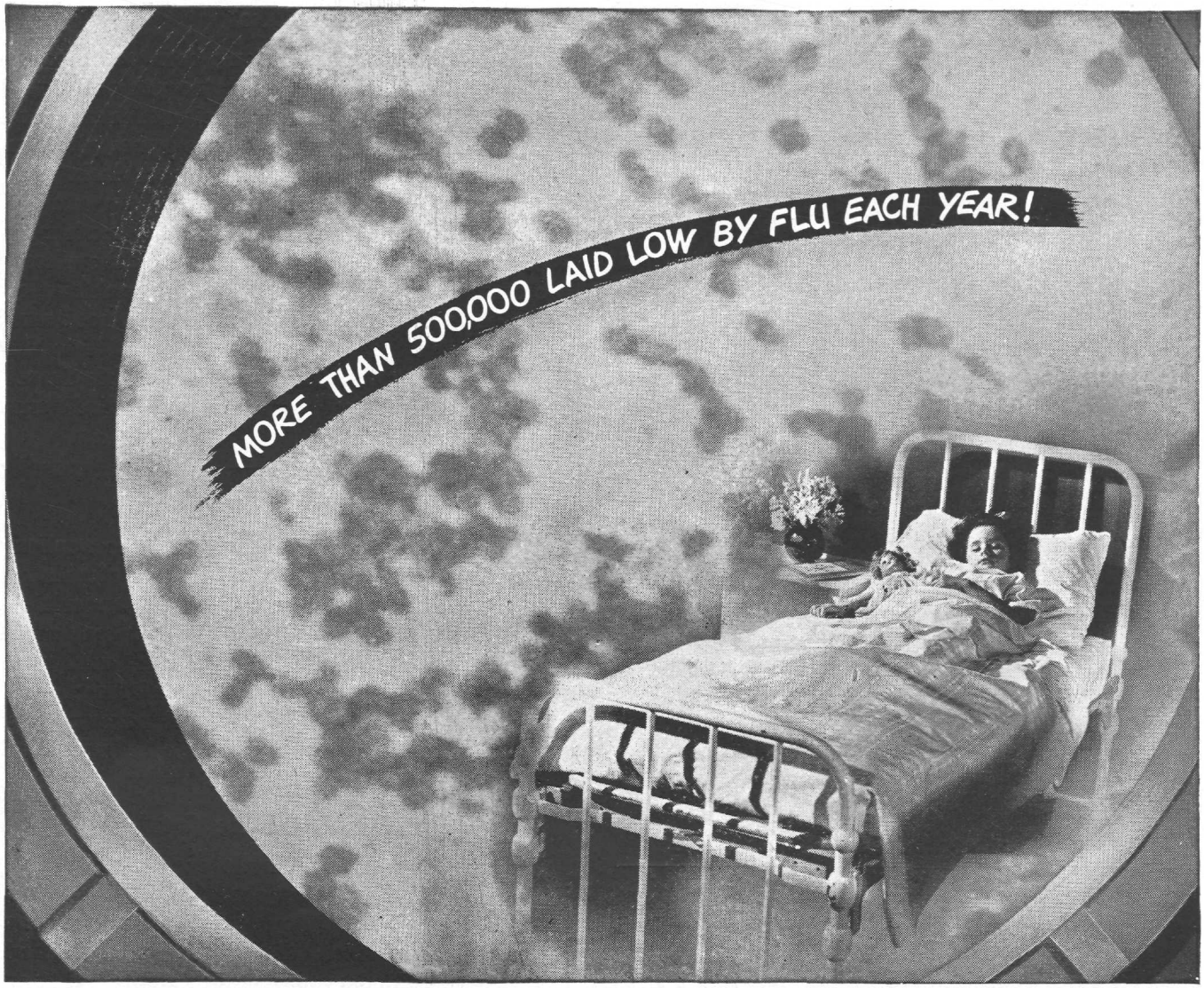
In peacetime touring, if you happened to tear your highway map, you got another without difficulty. Replacing a military map is a good deal harder. Moreover, war maps often have to be used under pretty trying conditions. They need to be printed on paper that will stand rough handling.

One of the achievements of the Bureau of Standards, reports the Ohio State University Research Foundation, is providing the Army with map paper. A new type was developed, one that can be produced in various parts of the United States, and that, according to the reports, can be successfully made of jack pine, spruce, and other kinds of pulp. The map paper is strong, even when it is soaked in water or oil. It can be tramped in the mud and then pretty thoroughly cleaned off. Even when it is soaked it will take writing and stand erasing. In the reserved language of scientists, this has "high wet strength."

Production of this paper has been reported as ten million pounds per month. After the war, several times that amount should be useful for maps and for other purposes.

Greatest Year for the Great Lakes

The Great Lakes deserve their name in many ways—transportation, for instance. The biggest year in shipping, so far, was 1944, with 184,000,000 tons of freight moved as against 128,750,000 in 1942. That was more than twice the war cargoes of our merchant fleet. Iron ore moved was down to 90 million tons from the record of 103 million tons in 1942. However, other commodities were up, notably coal with nearly 59 million tons (mostly loaded on Lake Erie) and grain, 16 million tons. Stone was 17 million, 18½ million in 1942.



to destroy 'em you have to see 'em

Microscopes are gunsights in Medicine's battle on bacteria.

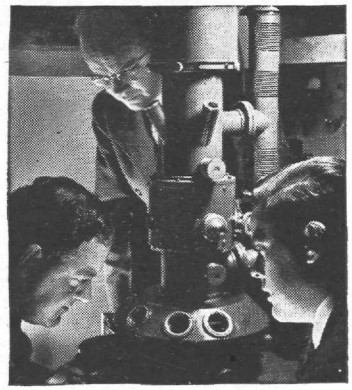
Optical microscopes, however, were not powerful enough to "draw an accurate bead" on the deadly virus that caused influenza.

But today, medical men have seen what no optical microscope could bring into focus—the infinitesimal influenza virus that previously had lain craftily camouflaged among larger cells.

This revelation came about through the Electron Microscope, developed by scientists at RCA Laboratories. And now, having been seen, influenza may be forced to unconditional surrender, saving the lives of thousands each year.

Here is but one facet of the genius shown by scientists behind RCA research . . . the "ever-onward" research that saves lives or creates a better radio with equal skill . . . the "there-when-you-need-it" research that gave super-secret equipment to the United Nations . . . the "way-ahead" research that goes into everything made by RCA.

When you buy an RCA radio or phonograph or television set or any RCA product, you get a great satisfaction . . . enjoy a unique pride of ownership in knowing that you possess the very finest instrument of its kind that science has yet achieved.



They see what human eyes have never seen before!

Drs. Arthur Vance and James Hillier, scientists at RCA Laboratories, with Mr. E. W. Engstrom, Research Director (standing), examine the RCA Electron Microscope that has useful magnification up to 100,000 diameters, revealing unseen new worlds to the eyes of man.

RADIO CORPORATION of AMERICA

PIONEERS IN PROGRESS

RCA

New Bike*

The tubular frame has long been accepted as the structure that would give strength and lightness to a bicycle. A different design of frame that may be in the market when peace comes gives an effect of streamlining that the tubes lack. The material is aircraft aluminum. All you can see is the sheet of metal, with seat, pedals, and handle bars in about the usual place and style; the wheels are completely covered up. Metal on each side of the wheels (up and over) gives the necessary strength, and the lightness is attributable to the aluminum. Some of the space inside this frame can be used as a compartment for a limited number of articles.

The Postwar Market*

The war has held back some valuable applications of science. For instance, enough sterilizing lamps, which were beginning to keep tenderizing meat from spoiling and to keep rest rooms sanitary, could be made to flood the country with rays that would bring death to bacteria and fungi. The market for such lamps in industrial locker rooms, not to mention gyms, would seem to be enormous.

Underwater Flame Cuts*

Rescue work on steel hulls capsized at Pearl Harbor and many other jobs of mercy and war have been performed by welding and cutting torches under water. It is oxyhydrogen, not oxyacetylene. Underwater flame cutting has been used to patch and salvage ships with torpedo holes in their hulls, and to plug holes and so prevent sinking. Arc cutting has been used, too; the waterproofed electrode is hollow and a stream of oxygen supplements the arc.

*Reported by the Ohio State University Research Foundation.